

Amdt. dated March 15, 2004
Reply to Office action of December 17, 2003

Serial No. 09/382,621
Docket No. TUC919990034US1
Firm No. 0018.0057

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A method for building a list of parameters to include with a command, comprising:

receiving a plurality of input parameters, wherein each input parameter comprises at least one extent, and wherein one extent defines a range of tracks between a beginning track and an end track;

determining whether a number of the input parameters exceeds a threshold number of parameters that are capable of being included in the command;

merging content of multiple input parameters into at least one output parameter if the number of input parameters exceeds the threshold number, wherein the content of the input parameters is included in a number of output parameters that does not exceed the threshold; and including the output parameters with the command.

2. (Currently Amended) The method of claim 1, ~~wherein one extent defines a range of tracks between a beginning track and end track,~~ wherein the beginning track of a given extent follows the tracks in all previous extents, and wherein each output parameter includes at least one input extent and wherein at least one output parameter includes the tracks from multiple input extents if the number of input extents exceeds the threshold number.

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3. (Previously Presented) A method for building a list of parameters to include with a command, comprising:

receiving a plurality of input parameters for the command, wherein each input parameter comprises at least one extent that defines a range of tracks between a beginning track and end track and wherein the beginning track of a given extent follows the tracks in all previous extents;

determining whether a number of the input parameters exceeds a threshold number of parameters that are capable of being included in the command;

merging content of multiple input parameters into at least one output parameter if the number of input parameters exceeds the threshold number, wherein the content of the input parameters is included in a number of output parameters that does not exceed the threshold, wherein each output parameter includes at least one input extent and wherein at least one output parameter includes the tracks from multiple input extents if the number of input extents exceeds the threshold number, and wherein there are n input extents, the threshold number of extents is m , and n is greater than m , further comprising:

(a) placing each of a plurality of $(m - k)$ input extents into $(m - k)$ separate output extents, wherein k is an integer less than n minus m ; and

(b) arranging the remaining $(m - k + 1)$ to n input extents into at least one of k output extents; and

including the output parameters with the command.

4. (Original) The method of claim 3, further comprising determining whether control data is stored in tracks before the $(m - k + 1)$ input extent, wherein arranging the remaining $(m - k + 1)$ to n input extents into at least one of k output extents comprises arranging the remaining input extents into one output extent if the control data is stored in tracks before the $(m - k + 1)$ input extent.

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5. (Original) The method of claim 3, further comprising:
determining whether control data is stored in tracks between the $(m - k + 1)$ and n input extents;
arranging the extents from the $(m - k + 1)$ input extent to the input extent immediately preceding the track storing the control data into a first output extent if the control data is stored in tracks between the $(m - k + 1)$ and n input extents; and
arranging the extents from the input extent following the control data to the n input extent into a second output extent if the control data is stored in tracks between the $(m - k + 1)$ and n input extents.
6. (Original) The method of claim 2, wherein merging multiple input tracks into one output extent further comprises defining the output extent as having a beginning track equal to the beginning track of a first of the multiple input tracks to merge and an ending track equal to the ending track of the a last of the multiple input tracks to merge.
7. (Original) The method of claim 2, further comprising:
determining whether control data is stored in tracks between the tracks of the input extents; and
arranging the tracks in the input extents into the output extents in a manner that avoids including any control data tracks in the tracks defined in the output extents.
8. (Original) The method of claim 2, wherein the command is a copy command to copy the track ranges defined in the output extents included as parameters to target tracks, wherein the target tracks are capable of storing a duplicate copy of the data in the track ranges defined in the output extents.

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9. (Original) The method of claim 8, wherein the copy command is a point-in-time copy command that indicates in data structures that the tracks in the output extents included as parameters are subject to a point-in-time copy relationship.

10. (Original) The method of claim 9, wherein the data in the tracks in one output extent subject to the point-in-time copy relationship are only copied to the target tracks if the data in one track in the output extents is modified.

11. (Currently Amended) A system for building a list of parameters to include with a command, comprising:

a processor;

means for receiving a plurality of input parameters, wherein each input parameter comprises at least one extent, and wherein one extent defines a range of tracks between a beginning track and an end track;

means for determining whether a number of the input parameters exceeds a threshold number of parameters that are capable of being included in the command;

means for merging content of multiple input parameters into at least one output parameter if the number of input parameters exceeds the threshold number, wherein the content of the input parameters is included in a number of output parameters that does not exceed the threshold; and

means for including the output parameters with the command.

12. (Previously Presented) The system of claim 11, further comprising a storage device wherein each input parameter comprises at least one extent that defines a range of tracks in the storage device between a beginning track and end track on the storage device, wherein the beginning track of a given extent follows the tracks in all previous extents, and wherein each output parameter includes at least one input extent and wherein at least one output parameter

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includes the tracks from multiple input extents if the number of input extents exceeds the threshold number.

13. (Original) The system of claim 12, wherein the processor comprises a first processor, further comprising:

a second processor in communication with the first processor and having access to the storage device;

means, implemented in the first processor to communicate the command including the output extent to the second processor; and

means, implemented in the second processor, for performing an operation defined by the command with respect to the output extents.

14. (Currently Amended) A system for building a list of parameters to include with a command, comprising:

a processor;

a storage device;

means for receiving a plurality of input parameters, wherein each input parameter comprises at least one extent that defines a range of tracks in the storage device between a beginning track and end track on the storage device and wherein the beginning track of a given extent follows the tracks in all previous extents;

means for determining whether a number of the input parameters exceeds a threshold number of parameters that are capable of being included in the command;

means for merging content of multiple input parameters into at least one output parameter if the number of input parameters exceeds the threshold number, wherein the content of the input parameters is included in a number of output parameters that does not exceed the threshold and wherein each output parameter includes at least one input extent and wherein at least one output parameter includes the tracks from multiple input extents if the number of input extents exceeds

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the threshold number, and wherein there are n input extents, the threshold number of extents is m , and n is greater than m , further comprising:

(a) means for placing each of a plurality of $(m - k)$ input extents into $(m - k)$ separate output extents, wherein k is an integer less than n minus m ; and

(b) means for arranging the remaining $(m - k + 1)$ to n input extents into at least one of k output extents; and

means for including the output parameters with the command.

15. (Original) The system of claim 14, further comprising means for determining whether control data is stored in tracks before the $(m - k + 1)$ input extent, wherein arranging the remaining $(m - k + 1)$ to n input extents into at least one of k output extents comprises arranging the remaining input extents into one output extent if the control data is stored in tracks before the $(m - k + 1)$ input extent.

16. (Original) The system of claim 14, further comprising:
means for determining whether control data is stored in tracks between the $(m - k + 1)$ and n input extents;
means for arranging the extents from the $(m - k + 1)$ input extent to the input extent immediately preceding the track storing the control data into a first output extent if the control data is stored in tracks between the $(m - k + 1)$ and n input extents; and
means for arranging the extents from the input extent following the control data to the n input extent into a second output extent if the control data is stored in tracks between the $(m - k + 1)$ and n input extents.

17. (Original) The system of claim 12, wherein merging multiple input tracks into one output extent further comprises means for defining the output extent as having a beginning track

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equal to the beginning track of a first of the multiple input tracks to merge and an ending track equal to the ending track of the a last of the multiple input tracks to merge.

18. (Original) The system of claim 12, further comprising:
means for determining whether control data is stored in tracks between the tracks of the input extents; and
means for arranging the tracks in the input extents into the output extents in a manner that avoids including any control data tracks in the tracks defined in the output extents.

19. (Original) The system of claim 12, wherein the command is a copy command to copy the track ranges defined in the output extents included as parameters to target tracks, wherein the target tracks are capable of storing a duplicate copy of the data in the track ranges defined in the output extents.

20. (Currently Amended) The system of claim 8 19, wherein the copy command is a point-in-time copy command that indicates in data structures that the tracks in the output extents included as parameters are subject to a point-in-time copy relationship.

21. (Original) The system, of claim 20, wherein the data in the tracks in one output extent subject to the point-in-time copy relationship are only copied to the target tracks if the data in one track in the output extents is modified.

22. (Original) The system of claim 21, wherein the processor comprises a first processor, further comprising:
a second processor in communication with the first processor and having access to the storage device;

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means, implemented in the first processor to communicate the command including the output extent to the second processor; and

means, implemented in the second processor, for performing the point-in-time copy operation.

23. (Currently Amended) An article of manufacture for use in building a list of parameters to include with a command, the article of manufacture comprising computer useable media accessible to a computer, wherein the computer usable media includes at least one computer program that is capable of causing the computer to perform:

receiving a plurality of input parameters, wherein each input parameter comprises at least one extent, and wherein one extent defines a range of tracks between a beginning track and an end track;

determining whether a number of the input parameters exceeds a threshold number of parameters that are capable of being included in the command;

merging content of multiple input parameters into at least one output parameter if the number of input parameters exceeds the threshold number, wherein the content of the input parameters is included in a number of output parameters that does not exceed the threshold; and including the output parameters with the command.

24. (Currently Amended) The article of manufacture of claim 23, ~~wherein one extent defines a range of tracks between a beginning track and end track;~~ wherein the beginning track of a given extent follows the tracks in all previous extents, and wherein each output parameter includes at least one input extent and wherein at least one output parameter includes the tracks from multiple input extents if the number of input extents exceeds the threshold number.

25. (Previously Presented) An article of manufacture for use in building a list of parameters to include with a command, the article of manufacture comprising computer useable

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media accessible to a computer, wherein the computer usable media includes at least one computer program that is capable of causing the computer to perform:

receiving a plurality of input parameters, wherein each input parameter comprises at least one extent that defines a range of tracks between a beginning track and end track and wherein the beginning track of a given extent follows the tracks in all previous extents;

determining whether a number of the input parameters exceeds a threshold number of parameters that are capable of being included in the command;

merging content of multiple input parameters into at least one output parameter if the number of input parameters exceeds the threshold number, wherein the content of the input parameters is included in a number of output parameters that does not exceed the threshold, wherein each output parameter includes at least one input extent and wherein at least one output parameter includes the tracks from multiple input extents if the number of input extents exceeds the threshold number and wherein there are n input extents, the threshold number of extents is m , and n is greater than m , further comprising:

(a) placing each of a plurality of $(m - k)$ input extents into $(m - k)$ separate output extents, wherein k is an integer less than n minus m ; and

(b) arranging the remaining $(m - k + 1)$ to n input extents into at least one of k output extents; and

including the output parameters with the command.

26. (Original) The article of manufacture of claim 25, further comprising determining whether control data is stored in tracks before the $(m - k + 1)$ input extent, wherein arranging the remaining $(m - k + 1)$ to n input extents into at least one of k output extents comprises arranging the remaining input extents into one output extent if the control data is stored in tracks before the $(m - k + 1)$ input extent.

27. (Original) The article of manufacture of claim 25, further comprising:

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determining whether control data is stored in tracks between the $(m - k + 1)$ and n input extents;

arranging the extents from the $(m - k + 1)$ input extent to the input extent immediately preceding the track storing the control data into a first output extent if the control data is stored in tracks between the $(m - k + 1)$ and n input extents; and

arranging the extents from the input extent following the control data to the n input extent into a second output extent if the control data is stored in tracks between the $(m - k + 1)$ and n input extents.

28. (Original) The article of manufacture of claim 24, wherein merging multiple input tracks into one output extent further comprises defining the output extent as having a beginning track equal to the beginning track of a first of the multiple input tracks to merge and an ending track equal to the ending track of the a last of the multiple input tracks to merge.

29. (Original) The article of manufacture of claim 24, further comprising:
determining whether control data is stored in tracks between the tracks of the input extents; and

arranging the tracks in the input extents into the output extents in a manner that avoids including any control data tracks in the tracks defined in the output extents.

30. (Original) The article of manufacture of claim 24, wherein the command is a copy command to copy the track ranges defined in the output extents included as parameters to target tracks, wherein the target tracks are capable of storing a duplicate copy of the data in the track ranges defined in the output extents.

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31. (Original) The article of manufacture of claim 30, wherein the copy command is a point-in-time copy command that indicates in data structures that the tracks in the output extents included as parameters are subject to a point-in-time copy relationship.

32. (Original) The article of manufacture of claim 31, wherein the data in the tracks in one output extent subject to the point-in-time copy relationship are only copied to the target tracks if the data in one track in the output extents is modified.